

SPE RESPONSE FOR CERTIFICATE OF CORRECTION

DATE : 12/16/08

Paper No.:

TO SPE OF : ART UNIT 2419

SUBJECT : Request for Certificate of Correction for Appl. No.: 10/521581 Patent No.: 7333435 B2

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2419
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UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 1 of 1

PATENT NO. : 7,333,435 B2

APPLICATION NO.: 10/521,581

ISSUE DATE : February 19, 2008

INVENTOR(S) : Anthony Gerkis

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 13, Lines 55 and 56 "said determined transmission capacity of said channel; and" should read --said determined transmission capacity of said link; and--

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Patent Administrator, Katten Muchin Rosenman LLC, 2900 K Street NW, Suite 200, Washington, D.C. 20007

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logical channel basis. Further, less conventional attributes, such as higher error correcting coding levels or even radio transmission power level margins can also be defined and implemented on a per logical channel basis. Also, other attributes such as whether and which types of header compression to apply to a flow can be defined per flow.

Further, traffic shapers can be implemented and configured on a per logical channel basis. This allows, for example, voice telephony data to be transferred over link 40 as necessary, while other data types can be data rate limited according to parameters defined by the network operator. Thus, a telephony call can be conducted unimpeded while a file transfer or other large data transfer can be subject to a leaky bucket, or other traffic shaping process.

As should now be apparent to those of skill in the art, the unique flexibility described above is achieved with a very low overhead impact on the transmission link capacity. Transmission of segments involves only the addition of a small header to each segment, the header identifying the sending logical channel and, in the case were segmentation of the packet has occurred, an indication of the segmentation of the packet and the location of the segment within the full packet.

The present invention provides for the efficient utilization of a shared resource, such as a radio link, in a network including heterogeneous links. Data is arranged in flows and each flow can be provided with its own logical channel with its own set of QoS attributes. These attributes can include prioritization, latency restrictions, data rate requirements, reliability requirements, etc.

The above-described embodiments of the invention are intended to be examples of the present invention and alterations and modifications may be effected thereto, by those of skill in the art, without departing from the scope of the invention which is defined solely by the claims appended hereto.

I claim:

1. A method of transmitting at least two data flows over a telecommunications link, wherein each data flow can have a different set of quality of service attributes defined for it, comprising the steps of:

- (i) receiving a packet for transmission over said link;
- (ii) examining said packet to determine an appropriate set of quality of service attributes required for it;
- (iii) placing said examined packet into one of a plurality of logical channel queues, said one logical channel queue having defined therefor quality of service attributes corresponding to the determined quality of service attributes required for said packet;
- (iv) determining a data transmission capacity for said link and selecting one of said plurality of logical channel queues which holds data to be transmitted with the highest priority for transmission and packaging and transmitting as much data from said logical channel queue as can be packaged to fit within said determined transmission capacity of said channel; and
- (v) repeating steps (i) through (iii) and step (iv) as necessary.

2. The method of claim 1 wherein:

said telecommunications link is structured into two or more channels and each of said two or more channels can have different amounts of data transmission capacity; and

each of said plurality of logical channel queues can be assigned to one or more of said two or more channels and in step (iv), the determined data transmission capacity is determined for each channel and, for each channel, one of the assigned logical channel queues is selected for transmission.

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3. The method of claim 2 wherein said two or more channels can comprise any of a dedicated channel between a pair of endpoints and a broadcast channel between an endpoint and a plurality of other endpoints.

4. The method of claim 3 wherein said dedicated channel transports data between a radio base station and a subscriber station and wherein said broadcast channel transports data between said radio base station and a plurality of subscriber stations.

5. The method of claim 4 wherein a set of logical channel queues is defined for each of said plurality of subscriber stations.

6. The method of claim 3 wherein a logical channel queue can be associated with a dedicated channel and at least one broadcast channel.

7. The method of claim 2 wherein the transmission capacity of each of said at least two channels is adjusted as needed to meet to service the logical channel queues assigned to it.

8. The method of claim 1 wherein the quality of service attributes include whether or not ARQ is to be performed for the data flow.

9. The method of claim 1 wherein the quality of service attributes include whether or not header compression is to be performed for the data flow.

10. The method of claim 1 wherein the quality of service attributes include whether or not a traffic shaping protocol is to be applied to said data flow.

11. The method of claim 1 wherein the contents of each logical channel queue are arranged according to a defined priority the current highest priority packet is selected for transmission only after transmission of the previous highest priority packet is completed.

12. The method of claim 11 wherein the contents of a different logical channel queue can be preemptively selected for transmission next before completion of transmission of a packet from another logical channel queue.

13. The method of claim 1 further comprising the step of creating a logical channel queue with a required set of quality of service attributes if, after step (ii), no logical channel queue is available with corresponding quality of service attributes and, in step (iii), placing said packet into said created logical channel queue.

14. A system for the transmission of data flows from a first endpoint to one or more of a plurality of other endpoints through a link where each flow can have different quality of service attributes defined therefor, comprising:

- a network interface at said first endpoint to receive packets from said data flows for transmission through said link to said other endpoints;
- a set of logical channel queues, each of said logical channel queues in said set being operable to queue a received packet and having a set of defined quality of service attributes defined for the contents of the queue;
- a packet classifier to examine said received packets to determine the quality of service attributes for said packet and to place received packets into selected ones of said logical channel queues with corresponding quality of service attributes; and
- a link controller which determines the available data transmission capacity to said plurality of end points and which selects for transmission a portion of a packet from the logical channel queue whose contents have the highest priority, the link controller segmenting the packet as necessary to have the portion fit within the data transmission capacity of said link.